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Concrete Saw Skid Plate Shielding Methods, Devices and Systems

Non-Provisional Utility Patent Application

RELATED DOCUMENT

This application is based on corresponding provisional application serial number 60/464,618 filed 04/22/2003 bearing substantially the same title by then co-inventor Michael P. Burke of NED Corporation who hereby claims priority there from.

BACKGROUND

This invention relates generally to improvements in concrete sawing systems. More particularly it relates to a skid plate interfaced to a concrete saw blade in a concrete saw cutting system. Even more particularly it relates to skid plate shielding methods, devices and systems. An embodiment comprises an offset shield mounted over a skid plate in concrete saw machine.

THE PROBLEM

In construction industry the problem of random cracking is obviated by early timing of the planned straight cuts in still wet concrete with concrete saw machine which employs a rotary saw extending partially through a skid plate. The shield improves the aesthetic appearance of the cut. Other problems with prior art skid plates can be summarized as follows.

- a) Not long lasting
- b) Not cost effective.
- c) Results in waste.
- d) Raises environmental concerns
- 5 e) Not easy to install, use and operate.
- f) Cut is not aesthetically appealing

SUMMARY

10 This invention comprises methods, devices and system for concrete saw systems that employ a skid plate over the concrete saw. There are a variety of reasons for improving the aesthetics of sawing concrete. An embodiment of this invention comprises an offset shield mounted over a prior art skid plate. Typically the skid plate shield is made of a low friction polymer which may be injection molded or extruded. Optionally it may require machining or some other form of finish. A
15 variety of methods of fastening the shield to the skid plate are suitable for achieving the objectives of this invention established by the inventor.

PRIOR ART

20 A preliminary limited prior art search was conducted. Furthermore the inventor is intimately familiar with the prior art. Following are typical examples of the prior art known to the applicant arranged in reverse chronological order for ready reference of the reader.

- a) United States Utility Patent US 5,664,553A awarded to Chiuminatta et al on September 9, 1997 for “Spring Loaded Skid Plate for a Concrete Saw”
- b) United States Utility Patent 5,305,729 presented to Chiuminatta et al on April 26, 1994 for “Method and Apparatus for Cutting Wet Concrete”
- c) United States Utility Patent 5,086,750 issued to Chiuminatta et al on February 11, 1992 for “Skid Plate for Concrete Saw.
- d) United States Utility patent 4,928,662 also awarded to Chiuminatta et al on May 29, 1990 for “Skid Plate for Cutting Unhardened Concrete.

None of the prior art devices known to the applicant or his attorney disclose the EXACT embodiment of this inventor that constitutes a simple, elegant, quick, convenient, affordable means of sawing concrete without having to replace skid plate each time the blade is replaced.

OBJECTIVES

Unfortunately none of the prior art devices singly or even in combination provide for all of the objectives as established by the inventor for this system as enumerated below.

1. It is an objective of this invention to provide improved methods, devices and system for quickly and safely sawing concrete.

2. Another objective of this invention is that it can facilitate use of prior art saw blades of different types, sizes and shapes.

5 3. Another objective of this invention is to improve the aesthetic appeal of the concrete cut.

4. Another objective of this invention is to reduce the friction between the skid plate and the concrete surface being cut by interfacing a polymer layer shield on the outside surface of the skid plate.

10 5. Another objective of this invention is to minimize consumable and wear and tear on the skid plate.

6. Another objective of this invention is that the device be portable and modular and interface-able to all types of prior art concrete saw cutting systems .

15 7. Another objective of this invention is that its design is simple and even elegant.

8. Another objective of this invention is that its use is intuitive and even user transparent such that it requires no additional training.

9. Another objective of this invention is that it use little or no additional energy.

20 10. Another objective of this invention is that the invention be user friendly having modular standard components easily interface-able transportable and storable.

11. Another objective of this invention is that it be environmentally friendly and use biodegrade materials to the extent practical.

12. Another objective of this invention is that it be physically safe in normal environment as well as accidental situations.

5 **13. Another objective of this invention is that it be long lasting made from durable material.**

14. Another objective of this invention is that it meet all federal, state, local and other private standards guidelines, regulations and recommendations with respect to safety, environment, energy consumption.

10 **15. Another objective of this invention is to provide a variety of methods for interfacing and attaching shield of this invention to the skid plate.**

16. Another objective of this invention is to prevent spalling

17. Another objective of this invention is to provide a shield without pre-machined slot such that the blade makes a custom slot with tighter tolerances.

15 **18. Other objectives of this invention reside in its simplicity, elegance of design, ease of manufacture, service and use and even aesthetics as will become apparent from the following brief description of the drawings and the detailed description of the concept embodiment.**

20 **Unfortunately none of the prior art devices singly or even in combination provide all of the features established by the inventor for this system as enumerated below.**

- a) Quick and effective
- b) Safe.
- c) Easy to install, operate, and change
- d) User Friendly, user transparent and intuitive
- e) Aesthetically appealing cut.
- f) Modular and Long lasting
- g) Requires no additional training
- h) Prevent spalling
- i) Plurality of fastener means

BRIEF DESCRIPTION OF THE DRAWINGS

These objects and features of the invention shall now be described in relationship to the following drawings.

a) Figure 1 is a 3D isometric view of an embodiment of the skid plate shield of this invention utilizing conventional fasteners of the prior art like nuts and bolts through holed provided in the shield.

b) Figure 2 (a) is a 3D isometric view of an alternate embodiment of the skid plate shield of this invention.

c) Figure 2 (b) is an exploded view of the skid plate shield embodiment of Fig. 2 (a)

d) Figure 3 shows an alternate method of attaching skid plate shield to the skid plate.

e) **Figure 4 (a) shows snap on method of attaching shield of this invention to the skid plate with plurality of lips at each corner of rectangular skid plate shield.**

5 f) **Figure 4 (b) shows slide method of attaching shield of this invention to the skid plate which instead of utilizing 4 lips, employs a pair of continuous parallel longitudinal members which facilitate sliding on & off the shield over the skid plate.**

10 g) **FIG. 5 shows 3D isometric view of yet another embodiment of skid plate shield and method of attaching the shield to the skid plate which in turn is attached to the saw or the blade block.**

h) **Figure 6 shows a side view of the skid plate & shield and their relationship to the saw blade and the concrete surface to be cut.**

i) **Figure 7 shows a 3D isometric perspective view of the skid plate & shield and their relationship to the saw blade.**

15 j) **Figure 8 (a) shows side view of yet another embodiment of the shield over skid plate.**

k) **Figure 8 (b) shows top view of the skid plate & shield of Fig. 8 (a)**

DETAILED DESCRIPTION OF THE BEST MODE PREFERRED EMBODIMENT

As shown in the drawings wherein like numerals represent like parts throughout the several views, there is generally disclosed in Figure 1 is a 3D isometric view of an embodiment of the skid plate shield of this invention complete with main horizontal member 110 and offset member 120 utilizing conventional fasteners of the prior art like nuts and bolts through holes 125 provided in the offset members 120 of the shield 110 shield.

Figure 2 (a) is a 3D isometric view of an alternate embodiment of the skid plate shield of this invention complete with principal horizontal member 210 and offset member 220 with holes 225 to facilitate fastening to the skid plate 99. Figure 2 (b) is an exploded view of the skid plate shield embodiment of Fig. 2 (a) showing horizontal main shield member 210 having holes 212 there in and offset member 220 having holes 222 and fastener means 225.

Figure 3 shows an alternate method of attaching skid plate shield to the skid plate complete with main horizontal shield member 310 and fastener means 312 as well as offset member 320 These embodiments of Figures 1-3 are best realized through injection molding.

On the other hand the Embodiments of Figures 4-5 are best realized when extruded with some variations requiring machining after extruding. Figure 4 (a) shows snap on method of attaching shield of this invention to the skid plate with plurality of smaller lips 420 on the opposite side of a pair of larger lips 430 at each corner of rectangular skid plate shield.

Figure 4 (b) shows slide method of attaching shield of this invention to the skid plate which instead of utilizing plurality of 4 lips, employs a pair of continuous parallel longitudinal slide members which act as continuous lips to facilitate easy on easy off over the skid plate by merely sliding in and out from either direction. Specifically this embodiment employs smaller longitudinal slide member 440 on the opposite side of larger longitudinal slide member 450

FIG. 5 shows 3D isometric view of yet another embodiment of skid plate shield complete with principal horizontal member 510 with polymer surface facing the concrete and method of attaching the shield to the skid plate 99 which in turn is attached to the saw or the blade block. This embodiment includes a plurality of lips 525 all on the same side of horizontal shield member 510. In the preferred embodiment the inventor(s) employed four lips but a different number can also work satisfactorily as a design choice.

Figure 6 shows a side view of the skid plate 601 and shield 610 and their relationship to the saw blade 699 and the concrete surface 690 to be cut.

Figure 7 shows a 3D isometric perspective view of the skid plate 701 and shield 710 and their relationship to the saw blade 799.

Figure 8 (a) shows side view of yet another embodiment of the shield 810 over skid plate 801 complete with spacer 820 and mounting hardware 815, 825.

Like wise Figure 8 (b) shows top view of the skid plate 801 and shield 810 of Fig. 8 (a) complete with spacer 820 and mounting hardware 815, 825.

ASSEMBLY USE AND OPERATION

The manufacturing, assembly and use of this invention is very simple even intuitive. Nonetheless the inventor recommends the following three methods.

5 **a) One obvious way to install the shield is to attach the shield using the bolts already on the saw or skid plate. In the case of smaller skid plate the shield 110 goes over the bolts (Not shown), which the skid plate 99 itself, is mounted on. These bolts protrude from the bottom plate of the saw itself.**

10 **The shield 110 is placed over the skid plate 99 and secured using the same threaded cap as would normally be used to secure only the skid plate. To secure the shield to skid plate has a set of bolts (Not shown) in the skid plate 99, the shield 110 is attached by removing the bolts (not shown), placing the shield 110 over the skid plate 99 (not shown) and aligning the bolt holes in the skid plate with holes 125 in the shield and then replacing and tightening the bolts (not shown) to securely fasten the shield 110 to the outside surface which contacts the concrete, of the skid plate**
15 **99. The skid plate 99 with the attached shield is then attached to the blade block (not shown) in the usual manner.**

20 **b) Another way to attach the shield to a skid plate is shown in Figure 3 which comprises a cross member 320 across the inside surface of the skid plate 99 which would secure the shield to the outside surface of the skid plate. This can be done by either snapping or sliding the cross member into place. Once the shield is in place the skid plate 99 can be attached to the blade block (Not shown) in the usual manner.**

c) Another way to attach the shield is the slide/snap on design shown in Figures 4 (a) and 4 (b) respectively. The shield has at least one lip 420, 430 built in on each side, one lip being larger 430 than the opposite side smaller lip 420. The edge of the skid plate 99 is slid under the lip and into the slot on the side with the larger lip 430. The skid plate 99 is then snapped down flush with the shield. The skid plate is then slid under the smaller lip 440 into the slot on that side securing the shield along the edge of the skid plates on both sides. As in methods a) and b) supra the skid plate can now be attached to the saw or blade block in the usual manner.

The shield is made of plastic which is softer than steel. Because it is softer than steel, it allows hard objects in the concrete to be pushed into the plastic rather than deflecting the objects into the concrete as steel would.

The inventor has given a non-limiting description of this invention. Due to the simplicity and elegance of the design of this invention designing around it is very difficult if not impossible. Nonetheless many changes may be made to this design without deviating from the spirit of this invention. Examples of such contemplated variations include the following:

1. The shape and size of the shield may be modified.

2. The color, aesthetics and materials may be enhanced or varied.

3. Additional complimentary and complementary functions and features may be added.

5 **4. A more economical version of the device may be adapted.**

5. The device may be fastened to the skid plate differently.

6. A different polymer or even a different material with similar properties may be employed

7. A pre-machined slot may be added to accommodate the circular saw blade

10 **8. The skid plate may be coated with a polymer or other hard material of low friction.**

9. Notwithstanding its undesirable properties and characteristics the shield may be chemically attached or bonded or to the skid plate with c epoxy or other strong adhesive.

15 **Other changes such as aesthetics and substitution of newer materials as they become available, which substantially perform the same function in substantially the same manner with substantially the same result without deviating from the spirit of the invention may be made.**

20 **Following is a listing of the components used in the best mode preferred embodiment and the alternate embodiments for use with OEM as well as retrofit markets. For the ready reference of the reader the reference numerals have been arranged in ascending numerical order.**

	099	=	Skid Plate of prior art in concrete saws.
	100	=	Skid plate shield of Fig. 1 generally
	110	=	Main horizontal shield of Figure 1
	120	=	L shaped offset member at each end of the shield 110
5	125	=	Holes in shield to facilitate fastening the shield to the skid plate
	200	=	Shield embodiment of Figure 2 generally
	210	=	Main horizontal shield member of Figure 2
	212	=	Fastener holes in shield 210
	220	=	Offset member at each end of shield 210
10	222	=	Fastener holes in offset members
	225	=	Fastener means for attaching shield to skid plate
	300	=	Embodiment of Figure 3 generally
	310	=	Main horizontal Shield member of Figure 3
	312	=	Complementary fastener means for fastening shield to skid plate
15	320	=	Complementary fastener means for fastening shield to skid plate
	400	=	Snap on shield design and method of fastening generally
	405	=	Slide on shield design and method of fastening generally
	410	=	Main horizontal shield member of Figure 4
	420	=	Smaller Lip on opposite side of larger lip
20	430	=	Larger Lip on opposite side of smaller lip
	440	=	Smaller slide on opposite side of larger
	450	=	Larger slide on opposite side of smaller slide

	500	=	Shield embodiment of Figure 5 generally
	510	=	Main horizontal shield member of Figure 5
	525	=	Plurality of lips arranged on same side of shield member 510
	600	=	Embodiment of Figure 6 generally
5	601	=	Skid Plate
	610	=	Shield over skid plate
	620	=	Spacer between skid plate and shield
	690	=	Concrete surface
	699	=	Circular Saw Blade
10	700	=	Embodiment of Figure 7 generally
	701	=	Skid Plate
	710	=	Shield over skid plate
	715	=	Mounting hardware
	720	=	Spacer between skid plate and shield
15	725	=	Mounting Fasteners
	799	=	Circular Saw Blade
	800	=	Embodiment of Figure 8 generally
	801	=	Skid Plate
	810	=	Shield over skid plate
20	815	=	Mounting hardware
	820	=	Spacer between skid plate and shield
	825	=	Mounting Fasteners

DEFINITIONS AND ACRONYMS

A great care has been taken to use words with their conventional dictionary definitions. Following definitions are included here for clarification.

3D = Three Dimension

5 **Blade = A circular saw tooth blade suitable for cutting concrete**

Interface = Junction between two dissimilar entities

Polymer = A compound of high molecular weight.

Skid Plate = A plate around blade to facilitate safe sawing of concrete

Shield = A shield interfaced to skid plate

10 The reader can now readily see how the above detailed description results in the following benefits of the polymer shield over the naked skid plate of the prior art.

a) The low friction polymer shield has no pre-machined slot in it for the blade. The blade cuts through the shield making its own "custom" slot. This
15 tightens the tolerances between the blade width and slot width to almost zero. These tolerances are much less than the skid plate by itself with its pre-machined slot. Since the tighter the tolerances the more improved ravel prevention the shield enables the cut to be smoother and cleaner than a skid plate by itself.

b) The shield is made of a polymer, it is much softer than steel, and therefore
20 is less likely to mar the surface of the concrete due to any nicks or burrs. Again, this results in a much better looking cut.

c) Since the shield is made from a polymer there is more natural give and flex than a steel skid plate. This allows the shield to maintain better contact with the concrete surface, which is critical to preventing spalling. Because plastic which is softer than steel, it allows hard objects in the concrete to be pushed into the plastic rather than deflecting the objects into the concrete as steel would.

d) The shield enables a used skid plate to be used more than once. By attaching a shield to a used skid plate it can be used over again without affecting the characteristics of the cut. This eliminates the need to use a new skid plate with every blade.

While this invention has been described with reference to illustrative embodiments, this description is not intended to be construed in a limiting sense. Various modifications and combinations of the illustrative embodiments as well as other embodiments of the invention will be apparent to a person of average skill in the art upon reference to this description. It is therefore contemplated that the appended claim(s) cover any such modifications, embodiments as fall within the true scope of this invention.